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REMARKS

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Claims 1-25 and 27-31 are currently pending in the subject application and are presently under consideration. Claims 1, 9, 13-14, 21-22, and 31 have been amended herein. A version of all pending claims is located on pages 5-8 of this Reply. In addition, the specification has been amended as indicated on pages 2-4 of the Reply. Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I.   Objection to Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the specification: Fig. 8, item 830 and Fig. 9, items 928 and 934. In view of the amendments to the specification, it is requested that these objections be withdrawn.

II.   Objection of Claims 9, 13 and 22

Claims 9, 13 and 22 are objected to for minor informalities. This objection should be withdrawn in view of the amendments made to claims 9, 13, and 22 to cure the informalities identified by the Examiner.

III.   Rejection of Claims 1-25 and 27-31 Under 35 U.S.C. §101

Claims 1-25 and 27-31 stand rejected under 35 U.S.C. §101 as it is alleged that the claimed invention lacks patentability utility. Withdrawal of this rejection is requested for at least the following reasons. The subject claims recited one or more useful, concrete and tangible result.

> Because the claimed process applies the Boolean principle [abstract idea] *to produce a useful, concrete, tangible result* ... on its face the claimed process comfortably falls within the scope of §101. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed. Cir. 1999) (Emphasis added); *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed.Cir.1998). The inquiry into patentability requires an examination of the contested claims to see if the claimed subject matter, as a whole, is a disembodied mathematical concept representing nothing more than a "law of nature" or an

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"abstract idea," or if the mathematical concept has been *reduced to some practical application rendering it "useful."* *AT&T* at 1357 *citing In re Alappat*, 33 F.3d 1526, 31 1544, 31 U.S.P.Q.2D (BNA) 1545, 1557 (Fed. Cir. 1994) (emphasis added).

According to *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the standard set forth by the Federal Circuit for determining whether claims are directed towards statutory subject matter is whether the claims as a whole can be applied in a practical application to *produce a useful, concrete and tangible result*. It is the result of the claims as applied in a practical application that is germane to the determination of whether claims are directed towards statutory subject matter. It is believed therefore that the subject claims clearly satisfy this legal standard. For instance, independent claim 1 (and similarly independent claims 9, 14, and 22) recites: *a range component that **determines the maximum and minimum values associated with each partition**; and a group component that **utilizes the maximum and minimum range values to determine independent partitions or partition groups**, wherein independent partitions or partition groups are **executed concurrently with other partitions**.* Thus, claim 1 elicits a series of independent acts that culminates in a useful, concrete and tangible result – the concurrent execution of independent partition or partition groups. Accordingly, withdrawal of this rejection with respect to independent claims 1, 9, 14, and 22 (and associated dependent claims) is requested.

IV. Rejection of Claims 1-25 and 27-31 Under 35 U.S.C. §103(a)

Claims 1-25 and 27-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Mittal *et al*. (US 2005/0138001) in view of Agrawal *et al*. (US 5,926,820) and further in view of Ballamkonda *et al*. (US 6,775,682). Withdrawal of this rejection is requested for at least the following reasons. Mittal *et al*., Agrawal *et al*., and Ballamkonda *et al*., either alone or in combination, fail to teach or suggest all features of the subject claims.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine reference teachings. Second there must be a reasonable expectation of success. Finally, *the prior art reference (or references when combined) must teach or suggest all the claim limitations*. *See* MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art and not based on the applicant's disclosure. *See In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (emphasis added).

Independent claims 1, 9, and 14

Applicants' claimed invention relates to the optimization of a distinct count query on large quantities of data. Specifically, independent claim 1 (and similarly independent claims 9 and 14) recites *a range component that determines the maximum and minimum values associated with each partition* and *a group component that utilizes the maximum and minimum range values to determine independent partitions or partition groups, wherein independent partitions or partition groups are executed concurrently with other partitions.* Mittal *et al.*, Agrawal *et al.* and Ballamkonda *et al.* are silent regarding such novel aspects of the claimed invention.

Mittal *et al.* provides a facility for performing a distinct count metric by utilizing aggregate navigation and calculating a distinct count metric by performing a count operation on a aggregate table. However, as the Examiner acknowledges, the primary reference does not teach or suggest a range component that determines the maximum and minimum values associated with each partition. Thus, to cure this deficiency the Examiner offers Agrawal *et al.*

Agrawal *et al.* provides a method for performing either maximum range or minimum range queries on a data cube and comprises partitioning the data cube into multi-level multi-dimensional blocks represented by a tree structure and determining an index to the maximum or minimum value for each block. In particular, Agrawal *et al.* provides for the partitioning of data cubes into multi-level structures of d-dimensional blocks. The blocks are represented as a multiple-level data structure such as hierarchical tree structure. The tree includes a root node that branches into a number of internal nodes. The nodes at a level n of the tree correspond respectively to a block at level n of the data cube. For each d-dimensional block, the index of the cell with the maximum value (or minimum value, for range-minimum queries) is determined. The index determined for each block is stored into the node corresponding to this block. The

range maximum or minimum is then generated from the values of the cells selected from those in query region Q and the cells referenced by the indexes stored at the nodes corresponding to the cells in the region Q. (*See* col. 6, line 60-col. 7, line 17). It is thus submitted that Agrawal *et al.* only provides a method for determining either the maximum range or the minimum range query in a database by decomposing the database into a multi-level structure of multidimensional blocks which minimizes the response time and required system storage space by determining the location of the minimum (or maximum) value in each block and storing the index to this value in the corresponding block of tree structure, such that either the range maximum or minimum query is quickly performed by simply traversing the nodes of the tree structure. Agrawal *et al.* however fails to teach or suggest a range component that determines the maximum *and* minimum values *associated with each partition*. In contrast, applicant's claimed invention facilitates determining both the maximum and minimum values associated with each partition wherein these values are utilized by a group component to determining independent partitions or partition groups.

As the Examiner concedes both Mittal *et al.* and Agrawal *et al.* are silent with respect to a group component that utilizes the maximum and minimum range values to determine independent partitions or partition groups, wherein independent partitions or partition groups are executed concurrently with other partitions. Thus to rectify this omission the Examiner offers Ballamkonda *et al.* Ballamkonda *et al.* relates to the evaluation of rollups with distinct aggregates by using a sequence of sorts and partitioning by measures. In particular, the tertiary document provides parallel evaluation of a rollup grouping with distinct aggregates which occur in three stages. At stage 1, the fact table and associated dimensional tables are scanned, joined, sorted and elimination of duplicate records is performed on the base table specified in the query so that the less data is forwarded to stage 2. To obtain efficient parallelization, the values associated with the measure of an aggregate function are included as a partitioning key, *viz.*, all records with a given measure from the stage 1 result are sent to the same stage 2 slave. The aggregate measure partitioning occurring between stage 1 and 2 is hash partitioning or range partitioning. (*See* col. 10, lines 10-28). It is submitted that the tertiary document provides for partitioning the records according to hash partitioning or range partitioning and parallel evaluation of these records, but does not teach or suggest determining independent partitions or partition groups, wherein independent partitions or partition groups are executed concurrently

with other partitions. In contrast, applicant's claimed invention facilitates utilizing the maximum and minimum range values to determine independent partitions or partition groups, wherein independent partitions or partition groups are executed concurrently with other partitions. Accordingly, for at least the foregoing reasons, withdrawal of this rejection with respect to independent claims 1, 9, 14 (and associated dependent claims) is requested.

Independent Claim 22

On page 9 of the Office Action, the Examiner asserts that Mittal *et al.* discloses ***pre-aggregating database data*** with respect to independent claim 22. Applicants' representative respectfully disagrees. The cited document provides ten records of orders placed by customers wherein each record is depicted as five columns or dimensions labeled "Order number," "Product," "Customer," "Order Date," and "Deliver to Zip." A first dimension is "dependent" on a second dimension if a value in the second dimension can have or can be associated with only one value in the first dimension. Otherwise, if a value in the second dimension can have or can be associated with multiple values in the first dimension, then the first dimension is considered "independent" of the second dimension. (*See* col. 58, lines 1-22). It is submitted that Mittal only provides records having five columns or dimensions and independency or dependency of these dimensions with respect to each other. However, Mittal *et al.* does not teach or suggest ***pre-aggregating database data*** as would be understood by those reasonably skilled in the art, and further Agrawal *et al.* and Ballamkonda *et al.* do not remedy this deficiency. Accordingly, withdrawal of this rejection with respect to independent claim 22 (and claims that depend there from) is requested.

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CONCLUSION

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The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP606US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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